

The search for Neutrinoless Double Beta Decay in Germanium

Saturday 11 November 2023 16:45 (15 minutes)

Physicists around the world have been trying to detect an extremely rare, but not invalidated by Standard Model, decay process called neutrinoless double beta decay (0νBB) in Ge since the late 1960s. Two recent experiments, Majorana and GERDA, have pushed the frontier by setting the limit of half-life to be $\sim 10^{26}$ years using ~ 40 kg of ^{76}Ge . This result eventually also puts an upper limit on effective neutrino mass (113-269 meV). These results have been achieved partly due to great energy resolution of these highly pure Ge detectors (0.12% FWHM around ROI). Riding on the success of these two demonstrator experiments, people have now joined together to build a ton-scale experiment in Gran Sasso, Italy, named LEGEND, with the same detection technology and stronger background-mitigation plan. 140 kg of that has already been deployed and preliminary results have come out recently. In this talk, I'll explain the experimental set-up, detection technology, a summary of preliminary results and IU group's ongoing work on next phase R&D of these detectors.

Author: Mr FUAD, Nafis (Indiana University)

Presenter: Mr FUAD, Nafis (Indiana University)

Session Classification: Afternoon session